

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
24 January 2002 (24.01.2002)

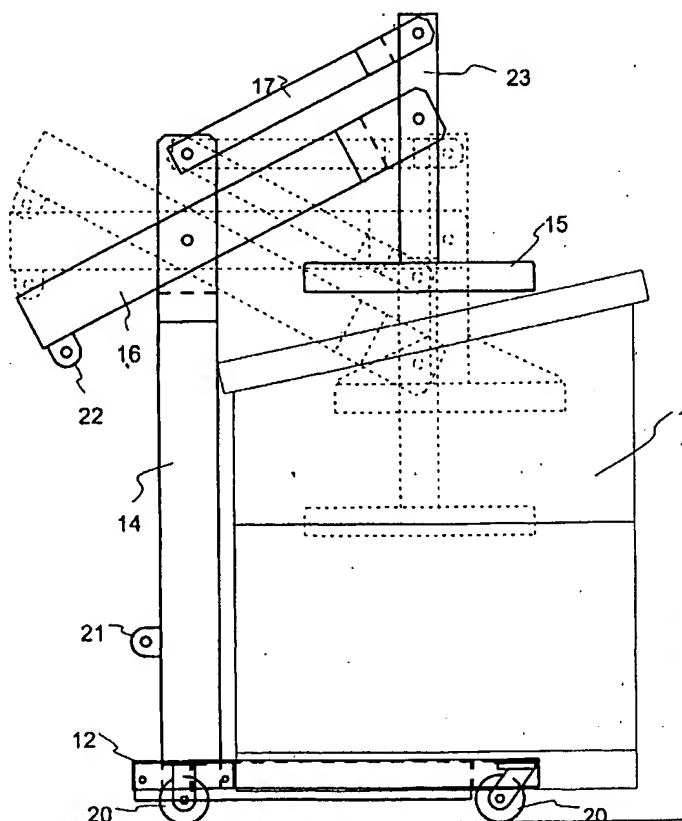
PCT

(10) International Publication Number
WO 02/06039 A1

- (51) International Patent Classification⁷: B30B 15/00 (71) Applicant and
(72) Inventor: FREEBERG, John [US/US]; 2874 Progress
Place, Escondido, CA 92029 (US).
(21) International Application Number: PCT/US01/01199
(22) International Filing Date: 11 January 2001 (11.01.2001) (74) Agent: HOLLAND, Joseph, W.; Holland Law Office,
P.C., P.O. Box 1840, Boise, ID 83701-1840 (US).
(25) Filing Language: English (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ,
BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK,
DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL,
IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU,
LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT,
RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA,
UG, US, UZ, VN, YU, ZA, ZW.
(26) Publication Language: English
(30) Priority Data: 09/615,610 14 July 2000 (14.07.2000) US
(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application: (84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
US 09/615,610 (CON)
Filed on 14 July 2000 (14.07.2000)

[Continued on next page]

(54) Title: PORTABLE REFUSE COMPACTOR



(57) Abstract: A portable refuse compactor (10) has a mobile compression frame (11) including a base (12) in the general shape of a "T". A trash bin bottom engagement surface (13) on the trunk of the "T" provides a purchase point against which compacting takes place. Compacting platen (15) is positioned above, and moveable with respect to the bin bottom engagement surface (13). Hydraulic ram (19) displaces platen (15) toward the bin bottom engagement surface (13).

BEST AVAILABLE COPY

BEST AVAILABLE COPY

WO 02/06039 A1



IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

BEST AVAILABLE COPY

5 **TITLE OF INVENTION:** PORTABLE REFUSE COMPACTOR

INVENTOR. John Freeberg, 2874 Progress Place, Escondido, CA
92029

10 **RELATED APPLICATIONS:** This application claims the benefit
under 35 USC 120 of United States application Serial No.
09/615,610, filed July 14, 2000 and entitled Portable Refuse
Compactor, which is herein incorporated by reference.

15 **DESCRIPTION****BACKGROUND OF THE INVENTION**

Technical Field. This invention generally relates to the
trash compactors. More specifically, this invention relates to a
20 portable trash compactor for reducing the volume occupied by
trash in dumpsters or similar trash bins.

Background. Many businesses and organizations are faced
with disposing of large amounts of trash or refuse. In most cases,
they are charged for disposal by both by the volume and frequency
25 of disposal. A single organization may possess several dumpsters
to reduce the frequency of pick-ups or to fit within a designated
schedule of the solid waste disposal company. Other organizations
install large permanent compactors that have removable bins for
emptying, usually on an as needed basis. Compacting the waste
30 within the bin greatly reduces the frequency for emptying the
dumpsters as a large amount of internal space is otherwise
unoccupied. Additionally, the nature of a large percentage of refuse
tends to be mostly empty space. Unfortunately, large compactors
are expensive to purchase and install, often requiring modifications
35 to the facility.

BEST AVAILABLE COPY

2

5 What is needed is an inexpensive portable compactor that
can be used with most standard dumpsters to reduce the volume of
refuse and enable less frequent emptying.

10

SUMMARY OF THE INVENTION

One embodiment of the invention provides a portable refuse
compactor having a mobile compression frame, including a trash
bin bottom engagement surface; a compacting platen positioned
15 above, and moveable with respect to, the bin bottom engagement
surface; and a force generator for displacing the platen toward the
bin bottom engagement surface. Here, the compression frame
includes a base having three caster wheels attached thereto to
facilitate mobility and an upwardly facing surface defining the bin
20 bottom engagement surface. An upright is attached to the base
opposite the engagement surface and extends upwardly from the
base. A compacting lever is pivotally attached near the upper end
of the upright between proximal and distal ends of the compacting
lever. A compacting platen is pivotally attached to the compacting
25 lever at its distal end. A hydraulic ram is connected between the
frame and the proximal end of the compacting lever such that
expansion of the ram under hydraulic pressure pivots the distal end
of the compacting lever through a downward arc. The compacting
platen here has an upright extending therefrom to which the distal
30 end of the compacting lever is pivotally attached and a vertical
guide lever is pivotally attached. The other end of the vertical guide
lever is pivotally attached to the compression frame in parallel
spaced relation to the compression lever. The vertical guide lever

BEST AVAILABLE COPY

3

5 maintains the compacting platen upright in a vertical orientation throughout the arc of travel of the distal end of the compacting lever. The hydraulic ram may be supplied by an electrical, gasoline or manually powered hydraulic pump.

10 Another embodiment of the invention has the compacting platen attached to the compacting arm using a gimbaled connection to ensure that the platen maintains even pressure across its surface area.

Additional advantages and novel features of the invention will be set forth in part in the description that follows, and in part will
15 become apparent to those skilled in the art upon examination of the following or may be learned by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

20

Fig. 1 is a perspective view of a portable trash compactor according to one embodiment of the invention;

Fig. 2 is a side view of the embodiment of Fig. 1 with the hydraulics removed for illustration purposes; and

25 Fig. 3 is a back side view of the base and upright of the embodiment of Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

30 Referring now to the figures, a portable refuse compactor 10 is illustrated according to one embodiment of the invention. Here compactor 10 has a mobile compression frame 11 including a base 12 in the general shape of a "T". A trash bin bottom engagement

BEST AVAILABLE COPY

5 surface 13 on the trunk of the "T" provides a purchase point against which compacting takes place. Compacting platen 15 is positioned above, and moveable with respect to, bin bottom engagement surface 13. Hydraulic ram 19 displaces platen 15 toward bin bottom engagement surface 13 thereby compressing the refuse
10 between platen 15 and the bottom of dumpster 1, which is support by bin bottom engagement surface 13.

Here, compression frame 11 has three caster wheels 20 attached to the underside of base 12 to facilitate mobility of the entire unit. Upright 14 is attached to base 12 opposite engagement
15 surface 13 at the top of the trunk of the "T". Compacting lever 16 is pivotally attached near the upper end of upright 14 between proximal and distal ends of compacting lever 16. Compacting platen 15 is pivotally attached to compacting lever 16 at the distal end of compacting lever 16. Hydraulic ram 19 is connected
20 between frame lug 21 and lever lug 22 on the proximal end of compacting lever 16 such that expansion of ram 19 under hydraulic pressure pivots the distal end of compacting lever 16 through a downward or upward arc, consequently lowering or raising platen 15. Here and advantageously, hydraulic ram 19 is a double acting
25 or bi-directional cylinder meaning that it will expand or contract depending upon which side of the cylinder hydraulic pressure is applied. Actuator valve 25 selects which side of the cylinder hydraulic pressure is applied to. An additional optional advantage is to include a check valve within the actuator which stops cylinder
30 movement at any point in either direction and "freeze" platen 15 in its current position.

Compacting platen 15 here includes platen upright 23 extending therefrom to which the distal end of compacting lever 16

BEST AVAILABLE COPY

5

- 5 is pivotally attached. A vertical guide lever 17 is also pivotally attached at its distal end to platen upright 23 above compacting lever 16. The other end of vertical guide lever 17 is pivotally attached to the upper end of upright 14 in parallel spaced relation to compression lever 16. Vertical guide lever 17 acts to maintain platen upright 23 in a vertical orientation throughout the arc of travel of the distal end of compacting lever 16. Here, platen 15 is supported by four webs 26 extending radially outward from platen upright 23 on the upper side of platen 15. Another embodiment has webs 26 positioned on the under compacting side of platen 15. This configuration places webs 26 under tension during compaction as opposed to compression when webs 26 are on the upper side of platen 15.

Hydraulic ram 19 is here supplied by an electrically powered hydraulic pump 24. However, it should be noted that ram 19 may be supplied by other sources such as gasoline or manually powered hydraulic pumps. Additionally, ram 19 could be replaced all together by mechanical devices such as a jack screw or similar displacement device.

A big advantage of the compression frame configuration is that the compaction load is born almost entirely by the refuse within dumpster 1 as opposed to the legs or casters supporting dumpster 1, the exception being the weight of portable compactor 10 which is small in comparison to the compressive force. Additionally, the load to which casters 20 are subjected is actually reduced during compaction to less than the weight of compactor 10. Consequently, fatigue on both dumpster 1 and compactor 10 is minimized.

Another embodiment of the invention has compacting platen 15 attached to compacting lever 16 using a gimbaled connection

BEST AVAILABLE COPY

6

- 5 (not shown) to ensure that platen 15 maintains even pressure
across its surface area.

While there are shown and described certain embodiments
of the invention, it is to be distinctly understood that this invention is
not limited thereto but may be variously embodied to practice within

- 10 the scope of the following claims.

I claim:

BEST AVAILABLE COPY

1 1. A portable refuse compactor for compacting refuse
2 within a trash bin which comprises:
3 a mobile compression frame having a trash bin bottom
4 engagement surface;
5 a compacting platen positioned above, and moveable with
6 respect to, the bin bottom engagement surface; and
7 a force generator for displacing the platen toward the bin
8 bottom engagement surface.

1 2. The compactor of claim 1 wherein the compression
2 frame further comprises:
3 a base having at least one wheel attached thereto to
4 facillitate mobility and an upwardly facing surface defining the bin
5 bottom engagement surface;
6 an upright being attached at a bottom end to the base and
7 extending upwardly therefrom;
8 a compacting lever being pivotally attached along the upright
9 between proximal and distal ends of the compacting lever; and
10 the compacting platen being pivotally attached to the
11 compacting lever at its distal end.

BEST AVAILABLE COPY

1 3. The compactor of claim 2 wherein the force generator
2 comprises a hydraulic ram connected between the frame and the
3 proximal end of the compacting lever.

1 4. The compactor of claim 3 further comprising:
2 the compacting platen having an upright extending
3 therefrom to which the distal end of the compacting lever is
4 pivotally attached; and
5 a vertical guide lever being pivotally attached at a proximal
6 end to the compression frame and pivotally attached to the platen
7 upright in parallel spaced relation to the compression lever.

BEST AVAILABLE COPY

1/3

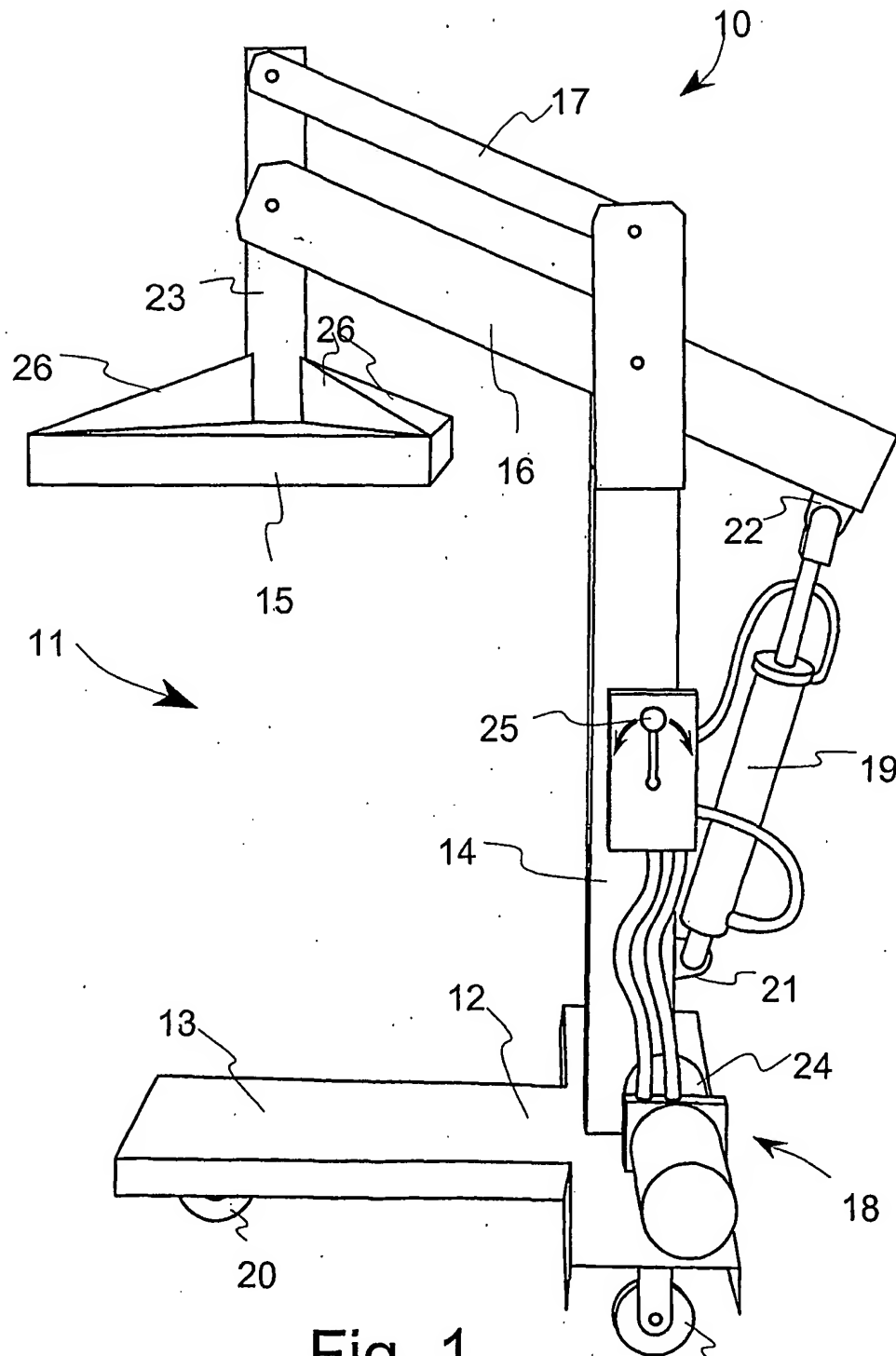


Fig. 1

BEST AVAILABLE ²⁰ COPY

2/3

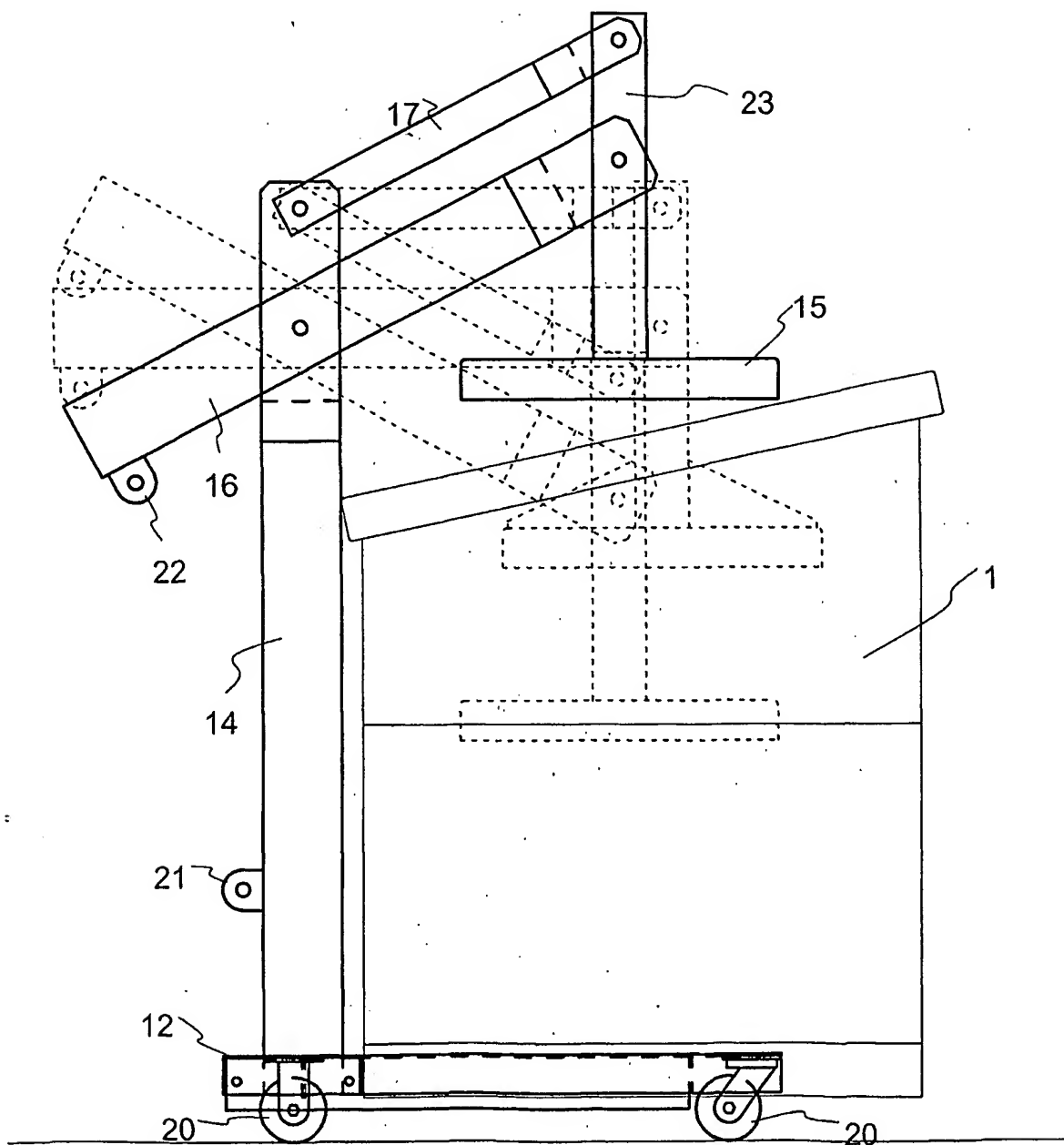


Fig. 2

BEST AVAILABLE COPY

3/3

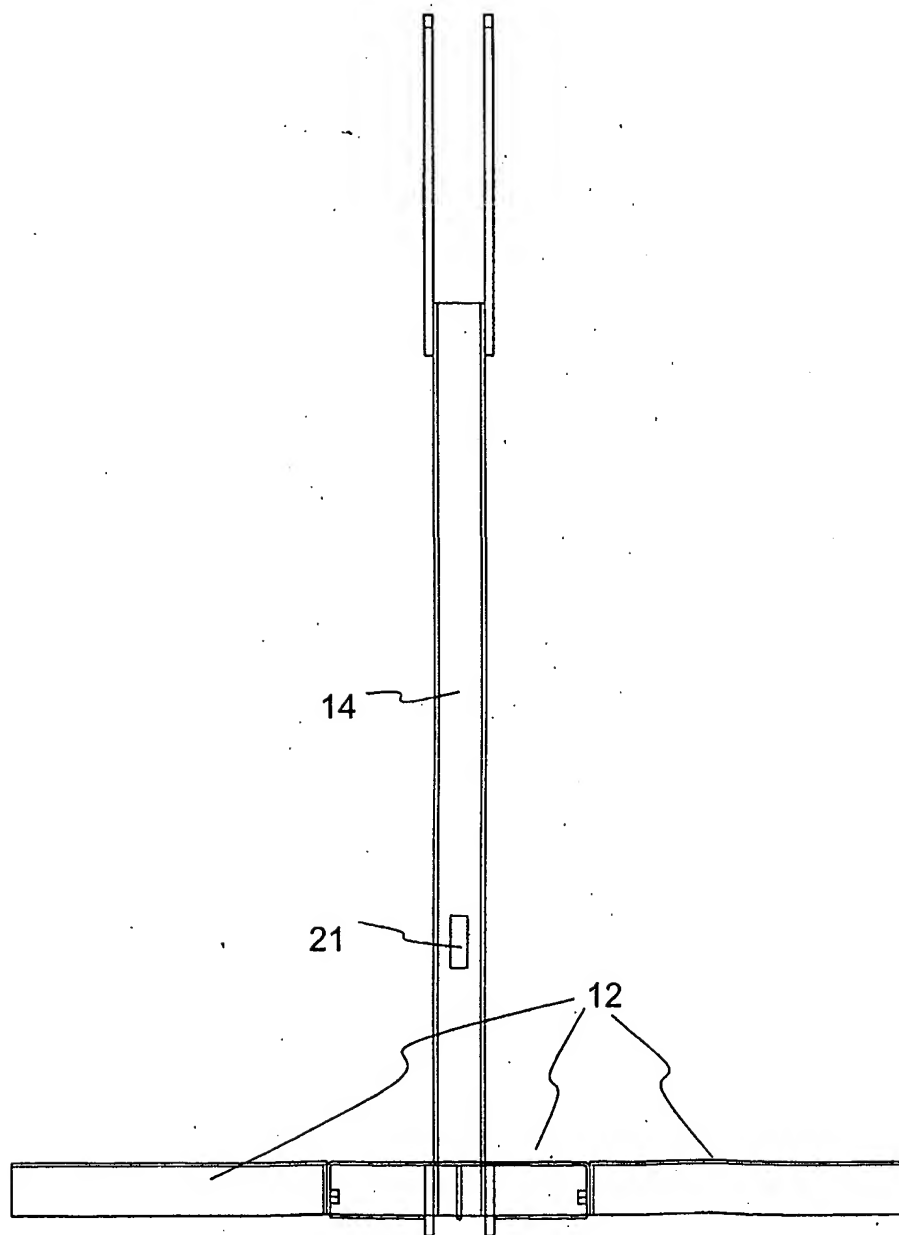


Fig. 3 BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/01199

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B30B 15/00

US CL : 100/100

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 100/100, 214, 229R, 231, 233, 236, 270, 269.17

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,357,346 A (CRAFOORD) 12 december 1967, See Figure 1	1
X	US 3,280,727 A (JONAS) 25 October 1966, See Figure 4	1-3
Y	US 3,797,382 A (MUZZI et al.) 19 March 1974, See Figure 1	4
X	US 4,700,623 A (DURBIN et al.) 20 October 1987, See Figure 2	1

BEST AVAILABLE COPY

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

07 March 2001 (07.03.2001)

Date of mailing of the international search report

04 APR 2001

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Ira Lazarus

Telephone No. (703) 308-1148

Sheila Veney
Patent Legal Specialist
Technology Center 3700